

Appl. No. : 10/728,126
Filed : December 3, 2003

REMARKS

In the Office Action mailed December 15, 2005, the Examiner rejected all pending claims. In the present Amendment and Response to Office Action, Applicants have added Claims 62-65. Applicants respectfully request entry of the new claims and full consideration of the remarks contained herein.

Newly Added Claims

Applicants respectfully submit that new Claims 62-65 add no new matter and are fully supported by the Application as originally filed. *See* the Application, *e.g.*, pp. 7-8 and 11-12, as originally filed.

Rejections Under 35 U.S.C. § 103

The Examiner has rejected independent Claims 1 and 15 and dependents as being unpatentable over Granneman *et al.* (U.S. Patent No. 6,183,565) in view of Matsumoto (U.S. Patent No. 4,859,625) alone or further in view of additional secondary references. In addition, independent Claim 55 and dependents are rejected over Granneman *et al.* in view of Matsumoto and Chae *et al.* (U.S. Patent No. 6,478,872). Granneman *et al.* is asserted for teaching the general features of the claimed apparatus. The Examiner noted, however, that Granneman *et al.* fails to teach a source of gas configured to supply reactants in alternating, separate pulses. Matsumoto is asserted for supplying this deficiency. Matsumoto teaches a deposition system in which reactants are supplied in alternating, separate pulses to form layers with monolayer accuracy. The Examiner stated that the skilled artisan would have been motivated to combine these references "in order to form a film of mixed materials wherein the thickness of the film can be controlled in monolayer accuracy." Chae *et al.* is asserted for teaching using two sets of gas channels, one for each of the reactants delivered in the alternating, separate pulses.

Applicants respectfully traverse the rejections.

The Art of Record Does Not Provide a Motivation to Combine the Asserted References

Initially, Applicants note that independent Claims 1, 15 and 55 recite a particular type of process chamber, having a particular arrangement of parts connected to a particular gas source configured for a particular type of reactant delivery to the chamber.

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As noted above, for establishing a *prima facie* case of obviousness, the Examiner has asserted Granneman *et al.* for showing the general arrangement of process chamber parts recited in the claims and has pointed to Matsumoto as showing an apparatus in which alternating pulses of reactant are delivered to a process chamber. Matsumoto discloses that the alternating pulses form monolayer thick films. The Examiner has noted that the monolayer thick films allowed for accurate thickness control. Consequently, the Examiner has asserted that the skilled artisan would have wanted to use the process of Matsumoto in the reactor of Granneman *et al.* As a result, the Examiner has stated that the skilled artisan would have been motivated to combine Granneman *et al.* with Matsumoto.

Applicants note that a suggestion to combine references must be found in the prior art in order to establish a *prima facie* case of obviousness. See *In re Dow Chemical Co.*, 5 U.S.P.Q.2d 1529, 837 F.2d 469 (Fed. Cir. 1988) (“the suggestion [to combine] ... must be founded in the prior art, not in the applicant’s disclosure.”). Moreover, evidence to support the asserted suggestion to combine must be clear and particular. See *In re Dembiczak*, 175 F.3d 994, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999) (obviousness must be supported by “clear and particular” evidence; “broad conclusory statements regarding the teaching of multiple references, standing alone, are not ‘evidence’” sufficient to support an obviousness rejection).

In the present case, the Examiner has not provided any particular suggestion for why the skilled artisan would use the reactor of Granneman *et al.* to perform the process of Matsumoto. The Examiner has asserted an advantage of Matsumoto—superior thickness control—but has failed to assert any reason why this advantage would motivate the skilled artisan to perform the process disclosed by Matsumoto in the particular reactor of Granneman *et al.* For example, there is no indication why the skilled artisan would make this particular combination, rather than a combination with any of the other myriad reactors known to the skilled artisan. Thus, even given the fact that Matsumoto’s process has advantages, the art of record provides no suggestion for why the skilled artisan would be motivated to select the *particular* reactor disclosed by Granneman *et al.* for combination with, *e.g.*, Matsumoto’s gas source. Because it does not provide any particular motivation for combining the reactor of Granneman *et al.* with the process of Matsumoto, the art of record does not establish a *prima facie* case of obviousness. In addition, regarding independent Claim 55, Applicants also submit that the art of record does not provide the requisite suggestion to combine Granneman *et al.* with Matsumoto and Chae *et al.*

In other words, the Examiner has asserted the advantages of Matsumoto only. No advantage is asserted for the combination with Granneman *et al.*

In addition, Granneman *et al.* teaches away from the presently claimed apparatus. Granneman *et al.* teaches that its disclosed reactor preferably has two side sections, one on either side of a substrate and each of which is kept at a different temperature. Granneman *et al.* also teaches that deposition results are closely tied to the substrate's temperature. Granneman *et al.* further teaches that the substrate's temperature is sensitive to distance from the side sections, which is dependent on the flow of gas to the substrate, since the substrate is floated on a gas cushion within the reactor's process chamber. *See, e.g.,* Granneman *et al.*, Col. 3, line 10 to Col. 4, line 19. In view of Granneman *et al.*'s teachings, a gas flow which repeatedly pulses on and off would have been expected to cause movement and vibration of the substrate, which would have been expected to adversely affect process results. As a result, given the substrate movement expected from a pulsed gas flow, Granneman *et al.*'s teachings regarding the sensitivity of substrate temperature and deposition results upon substrate position teaches against combining Granneman *et al.*'s reactors with a device, such as a source of pulsed gas flow, which would be expected to cause undesired changes in substrate position.

At most, the advantage disclosed by Matsumoto would indicate to the skilled artisan that it may be advantageous to try Matsumoto's process with various reactors. Obvious to try, however, is not a permissible standard for obviousness. *See In re O'Farrell*, 853 F.2d 894, 7 U.S.P.Q. 2d 1673 (Fed. Cir. 1988) (obviousness cannot be established by finding that it was "obvious-to-try" ... to explore a new technology or general approach that seemed to be a promising field of experimentation").

Rather, Applicants submit that it is the present Application which has advantageously taught a reactor or deposition station, having first and second closely spaced parts for accommodating a substrate, which can be used with alternating separated pulses of reactants. Moreover, Applicants have recognized particular advantages for combining a pulsed flow gas source with a deposition apparatus having first and second closely spaced parts; the claimed apparatus advantageously has a low volume, which, in addition to the ability to discharge reactants from at least one of the parts, as recited in some claims, advantageously allows for rapid and efficient switching of reactants, thereby allowing for high quality deposition results and good

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throughput. Neither these advantages nor any others are recognized by the art for the asserted combination.

Accordingly, Applicants respectfully submit that the pending claims are allowable over the art of record. Applicants have not addressed the further rejections of each dependent claim as being moot in view of the amendments and remarks herein. However, Applicants expressly do not acquiesce in the Examiner's findings not addressed herein. Indeed, Applicants submit that the dependent claims recite further novel and non-obvious features of particular utility.

CONCLUSIONS

In view of the foregoing remarks, Applicants submit that the application is in condition for allowance and respectfully request the same. If some issue remains that the Examiner feels may be addressed by Examiner's amendment, the Examiner is cordially invited to call the undersigned for authorization.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

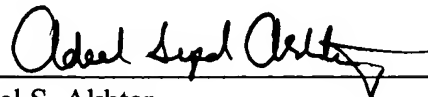
Respectfully submitted,

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Dated: _____

March 15, 2006

By: _____



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